

**TECHNICAL REVIEW DOCUMENT**  
**For**  
**RENEWAL of OPERATING PERMIT 04OPAD270**

Public Service Company of Colorado – Blue Spruce Energy Center  
Adams County  
Source ID 0011354

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June 2010

Revised September and October 2010

Revised December 22, 2010 to address Administrative Amendment received prior to  
renewal permit issuance.

**I. Purpose:**

This document will establish the basis for decisions made regarding the applicable requirements, emission factors, monitoring plan and compliance status of emission units covered by the renewed operating permit proposed for this site. The original Operating Permit was issued January 1, 2006. The expiration date for the permit is January 1, 2011. This document is designed for reference during the review of the proposed permit by the EPA, the public, and other interested parties. The conclusions made in this report are based on information provided in the renewal application submitted December 30, 2009, additional information submitted on June 14, 2010, comments on the draft permit and technical review document received on September 7, 2010 via e-mail, previous inspection reports and various e-mail correspondence, as well as telephone conversations with the applicant. Prior to issuance of the renewal permit Public Service Company of Colorado (PSCo) purchased Blue Spruce Energy Center, LLC and its assets from Calpine Operating Services Corporation and PSCo subsequently dissolved Blue Spruce Energy Center, LLC. PSCo submitted an administrative amendment on December 20, 2010 to transfer ownership of the permits issued to Blue Spruce Energy Center, LLC to Public Service Company of Colorado. The final issued renewal permit reflects the transfer of ownership. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at <http://www.cdphe.state.co.us/ap/Titlev.html>.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating

permit without applying for a revision to this permit or for an additional or revised construction permit.

## II. Description of Source

The Blue Spruce Energy Center consists of two simple cycle combustion turbines used to generate electric power under Standard Industrial Classification 4911. The combustion turbines are primarily fueled by natural gas and are designed to burn distillate fuel oil as a back-up fuel source. The gross electrical power output of each combustion turbine is 151.9 MW (at 5600 ft and 20 °F). The combustion turbines also have the capability of injecting steam, water, air or some combination thereof, for the generation of additional power. This process is referred to as power augmentation.

The facility is located at 1751 N. Powhatan Road (on the north side of Interstate 70 at the intersection of Smith Road and Powhatan Road). The facility is located within the Denver metro area, which is classified as attainment/maintenance for particulate matter less than 10 microns (PM<sub>10</sub>) and carbon monoxide. Under that classification, all SIP-approved requirements for PM<sub>10</sub> and CO will continue to apply in order to prevent backsliding under the provisions of Section 110(I) of the Federal Clean Air Act. The Denver Metro Area is classified as nonattainment for ozone and is part of the 8-hr Ozone Control Area as defined in Colorado Regulation No. 7, Section II.A.1.

There are no affected states within 50 miles of the facility. In addition, Rocky Mountain National Park, a federal class I area is within 100 km of this facility.

Based on the information provided in the renewal application, no changes have been made to any of the significant emission units.

The summary of emissions that was presented in the Technical Review Document (TRD) for the original permit has been reproduced here. Since there have been no changes to permitted emission and/or fuel consumption limitations and no new emission units have been added to the facility, the potential to emit (PTE) has not changed. Potential emissions (in tons per year) at the facility are as follows:

Emission Unit	Potential to Emit (tons/yr)						
	PM	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	HAPS
Turbine (CT-01)*	18.1	18.1	13.65	47.25	26.7	2.15	See Table on Page 10
Turbine (CT-02)*	18.1	18.1	13.65	47.25	26.7	2.15	
Total	36.2	36.2	27.3	94.5	53.4	4.3	5.07

\*permitted emission limits are for both turbines together, emissions are assumed to be split between the 2 units.

The criteria pollutant PTE shown above is based on permitted emission limits for the turbines.

The source generally does not report actual emissions and pays fees on potential to emit. Therefore, actual emissions are not shown.

The breakdown of HAP emissions by emission unit and individual HAP is provided on page 10 of this document. The PTE of HAP emissions is based on the California Air Toxics Emission Factors and the permitted fuel consumption limits.

### MACT Requirements

Although the facility is not a major source for HAPS, the EPA has been promulgating rules for area sources (sources that are not major), those requirements that could potentially apply to this facility are discussed below:

#### Paint Stripping and Miscellaneous Surface Coating at Area Sources (40 CFR Part 63 Subpart HHHHHH)

The final rules for paint stripping and miscellaneous surface coating were published in the Federal Register on January 9, 2008 and apply to area sources that perform paint stripping operations using methylene chloride, spray application of coatings to motor vehicles and mobile equipment and spray application of coatings that contain the target HAPS (chromium, lead, manganese, nickel or cadmium). As indicated in 40 CFR Part 63 § 63.11170(a)(2) and (3), spray applications (to motor vehicles and using coatings that contain the target HAPS) that meet the definition of facility maintenance are not subject to the requirements in this rule. The Division considers that any spray coatings of motor vehicles and mobile equipment and spray application of coatings that contain the target HAP at this facility would meet the definition of facility maintenance. The source indicated that none of the paint stripping chemicals used at the facility contain methylene chloride; therefore, the provisions in 40 CFR Part 63 Subpart HHHHHH do not apply.

#### Reciprocating Internal Combustion Engines (RICE) (40 CFR Part 63 Subpart ZZZZ)

Final revisions to the RICE MACT were published in the Federal Register on March 3, 2010 and these revisions address existing (commenced construction prior to June 12, 2006) compression ignition engines at area sources. The insignificant activity list indicates that there is a diesel-fired engine driving a fire pump at the facility. This engine is considered an emergency engine. Since this engine was in the January 1, 2006 original Title V permit, this engine is an existing engine and is subject to requirements in MACT ZZZZ. Since this engine is considered an emergency engine it is subject to management standards (oil and filter change and inspect air cleaners, hoses and belts). The source is required to comply with these requirements by May 3, 2013. The appropriate applicable requirements will be included in the permit.

#### Compliance Assurance Monitoring (CAM) Applicability

CAM applies to any emission unit that is subject to an emission limitation, uses a control device to achieve compliance with that emission limitation and has potential pre-control emissions greater than major source levels. The turbines are equipped with dry low NO<sub>x</sub> (DLN) combustion systems and when burning distillate oil, the turbines utilize water injection to reduce NO<sub>x</sub> emissions. DLN combustion systems are considered inherent process equipment and therefore are not control devices as defined in 40 CFR Part 64 § 64.1, as adopted by reference in Colorado Regulation No. 3, Part C, Section XIV. However, the Division considers that water injection is a control device. Nevertheless because the Title V permit specifies a continuous monitoring method for NO<sub>x</sub> the turbines are not subject to the CAM requirements as provided for in 40 CFR Part 64 § 64.2(b)(vi), as adopted by reference in Colorado Regulation No. 3, Part C, Section XIV.

### Greenhouse Gases

In 2009 and 2010, EPA issued two rules related to Greenhouse Gases (GHG) that may affect your facility.

On October 30, 2009, EPA published a rule for the mandatory annual reporting of GHG emissions to EPA from large GHG emissions sources in 40 CFR part 98. You may be required to identify GHG emissions in future Title V permit applications. Such identification may be satisfied by including some or all of the information reported to EPA to meet the GHG reporting requirements.

## **III. Discussion of Modifications Made**

### **Source Requested Modifications**

The source submitted their renewal application on December 30, 2009. In their renewal application, the source did not request any changes to their permit.

### **Other Modifications**

In addition to the modifications requested by the source, the Division has included changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this renewal.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments, to the Blue Spruce Energy Center Renewal Operating Permit with the source's requested modifications. These changes are as follows:

Page Following Cover Page

- The monitoring and compliance periods and report and certification due dates are shown as examples. The appropriate monitoring and compliance periods and report and certification due dates will be filled in after permit issuance and will be based on permit issuance date. Note that the source may request to keep the same monitoring and compliance periods and report and certification due dates as were provided in the original permit. However, it should be noted that with this option, depending on the permit issuance date, the first monitoring period and compliance period may be short (i.e. less than 6 months and less than 1 year).

## Section I – General Activities and Summary

- Revised the language in Condition 1.1 to address attainment status of the area in which the facility is located and corrected the citation for the definition of 8-hr ozone control area.
- Revised the language in Condition 1.4 to include Section IV, Condition 3.d and to note that only part of Condition 3.g is state-only enforceable (last paragraph). Note that Section IV, Condition 3.d (affirmative defense provisions for excess emissions during malfunctions) is state-only until approved by EPA in the SIP.
- Made minor revisions to the language in Condition 3 (prevention of significant deterioration) to be more consistent with other permits. In addition, revised this condition to address the attainment status of the area in which the facility is located.
- Revised the CAM language (Condition 5.1) to explain why CAM does not apply to the turbines.
- Added a column to the Table in Condition 6.1 for the startup date of the equipment. In addition, the diesel-fired fire pump engine was included in the table.

## Section II.1 – Turbines

- Revised the stack test requirement in Condition 1.2.3.4.

Stack tests were conducted on March 17 & 18, 2010 when the units were burning natural gas. The results of these tests indicated that PM<sub>10</sub> emissions were 0.005 lb/mmBtu for Unit 1 and 0.003 lb/mmBtu for Unit 2, both of which are less than 50% of the PM<sub>10</sub> RACT limit of 0.015 lb/mmBtu. The initial performance tests for these units (conducted in 2003) indicated that PM<sub>10</sub> emissions from Unit 1 were more than 50% of the RACT limit (0.010 lbs/mmBtu vs. 0.015 lb/mmBtu RACT limit), therefore, the Division required a test within the last 18 months of the permit term. Given that the 2010 test indicated that PM<sub>10</sub> emissions from both units were well below 50% of the RACT limit, the Division considers that further testing when burning natural gas as fuel is not necessary.

Note that the Division did not revise the PM and PM<sub>10</sub> emission factors for the turbines when burning natural gas (listed in Condition 1.2.1 of the permit). The emission factors are based on the more conservative 2003 performance test.

As of the date of this document, the PM<sub>10</sub> performance tests required by Condition 1.2.3.4 of the permit have not been conducted for the turbines when burning distillate oil. Although the initial performance tests (conducted in 2003) indicated that PM<sub>10</sub> emissions when burning distillate oil were below 50% of the standard, the Division required a second test for PM<sub>10</sub> emissions for both natural gas and distillate oil firing. The Division considers that the turbines are likely to emit more PM<sub>10</sub> emissions when burning distillate oil than when burning natural gas, so the Division considers that further tests may be warranted when burning distillate oil. Since distillate oil is primarily used as a back-up fuel, the Division considers that further testing is only warranted if the turbines run for an extended period on distillate oil. Assuming a distillate oil heat content of 135,000 Btu/gal (as indicated on APENS submitted for these turbines), the maximum capacity of each turbine to burn distillate oil is  $12 \times 10^3$  gal/hr. The turbines are permitted to burn  $8,476 \times 10^3$  gal/yr which means that both turbines together are limited to 706 hrs/yr of operation on distillate oil (if operated at maximum capacity). Therefore, the Division will revise the permit to require a performance test for PM<sub>10</sub> if the turbines burn distillate oil for 1,000 hours in any consecutive two year period.

- Removed the sentence beginning with “[f]or the first eight weeks following permit issuance..” in Conditions 1.5.1 and 1.6.1, since this sentence addresses interim calculation methods that no longer apply.
- Based on comments received on September 7, 2010 from the source, minor revisions were made to the definition of “shutdown” in Condition 1.5.1.1.f.
- Corrected the references to definitions in Condition 1.6.1.2.e and f.

## Section II.2 – Continuous Emission Monitoring Requirements

- Removed the phrase “and the traceability protocols of Appendix H” from Condition 2.1.1.2, since Appendix H of the current version of 40 CFR Part 75 is “reserved”. Note that this condition specifies that the continuous emission monitoring systems are subject to the requirements of 40 CFR Part 75 and that would include any applicable appendices, regardless of whether or not they are specifically called out in this condition.

## “New” Section II.3 – Emergency Compression Ignition Engine

There is one engine included in the insignificant activity list that is considered insignificant under the provisions in Colorado Regulation No. 3, Part C, Sections II.E.3.xxx (stationary internal combustion engines). However, under the “catch-all” provisions in Regulation No. 3, Part C, Section II.E, sources that are subject to any

federal or state applicable requirement, such as National Emission Standards for Hazardous Air Pollutants (NESHAPs), may not be considered insignificant activities. EPA promulgated National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines on March 3, 2010 which apply to this engine; therefore, it can no longer be considered an insignificant activity. Although the unit cannot be considered an insignificant activity, since the Division has not adopted either the January 18, 2008 or March 3, 2010 revisions to the RICE MACT, both of which address area sources, the engine is still exempt from APEN reporting and minor source construction permit requirements.

The engine description is as follows:

**Clarke, Model No. JU6HUF50, Serial No. PE6068T195387, rated at 210 hp, with a fuel use rate of 12.3 gal/hr (1.68 mmBtu/hr, based on a diesel fuel heat content of 137,000 Btu/gal).**

The appropriate applicable requirements for this engine are as follows:

- Except as provided for below, visible emissions shall not exceed 20% opacity (Reg 1, Section II.A.1)
- Visible emissions shall not exceed 30% opacity, for a period or periods aggregating more than six (6) minutes in any sixty (60) minute period, during fire building, cleaning of fire boxes, soot blowing, start-up, process modifications, or adjustment or occasional cleaning of control equipment, when burning coal (Reg 1, Section II.A.4)

Based on engineering judgment, the Division believes that the operational activities of fire building, cleaning of fire boxes and soot blowing do not apply to diesel engines. In addition, since this engine is not equipped with control equipment the operational activities of adjustment or occasional cleaning of control equipment also do not apply to this engine. Finally, based on engineering judgment, it is unlikely that process modifications will occur with this emergency engine. Therefore, for this unit the 30% opacity provision only applies during startup.

- SO<sub>2</sub> emission shall not exceed 0.8 lbs/mmBtu (Reg 1, Section VI.B.4.b.(i)).
- 40 CFR Part 63 Subpart ZZZZ requirements – management practices (oil and filter change, inspect air cleaner and inspect hoses and belts)
- 40 CFR Part 63 Subpart A requirements

Since this engine is not subject to any emission limitations, monitoring requirements, notification and reporting requirements the requirements in §§ 63.7, 63.8, 63.9 and 63.10 do not apply. In addition, since this emission unit is an existing unit the requirement in § 63.5 (preconstruction review and notification

requirements) do not apply. Finally, Table 8 of Subpart ZZZZ indicates that operation and maintenance requirements in 63.6(e) do not apply. Therefore, the permit will only include the prohibition and circumvention requirements in § 63.4.

Since this unit is not subject to APEN reporting or minor source construction permit requirements, the permit will not include any requirements for calculating emissions.

### Section III – Acid Rain Requirements

- Revised the Alternate Designated Representative.
- Revised the table in Section 2 to include calendar years corresponding to the relevant permit term for the renewal.
- Minor changes were made to the standard requirements (Section 3), based on changes made to 40 CFR Part 72 § 72.9.
- Removed the requirement to submit the annual reports and compliance certifications in Section 4. As a result of revisions to the Acid Rain Program made with the Clean Air Interstate Rule (final published in the federal register on May 12, 2005), annual compliance certifications are no longer required, beginning in 2006. Note that although the CAIR rule was vacated (July 2008), this revision was unrelated to the CAIR rule and it is expected that these changes will not be affected by the CAIR vacatur. Note that in December 2008, the vacatur of the CAIR rule was over-turned.
- Removed the sentence at the beginning of Section 4 indicating that reports will be sent to the addresses in Appendix D, since reports are submitted electronically.

### Section V – General Conditions

- Added a version date to the General Conditions.
- The upset requirements in the Common Provisions Regulation (general condition 3.d) were revised December 15, 2006 (effective March 7, 2007) and the revisions were included in the permit. Note that these provisions are state-only enforceable until approved by EPA into Colorado's state implementation plan (SIP).
- Removed the statement in Condition 3.g (affirmative defense provisions) addressing EPA approval and state-only applicability. The EPA has approved the affirmative defense provisions, with one exception and the exception, which is state-only enforceable is identified in Section I, Condition 1.4.
- Replaced the reference to "upset" in Condition 5 (emergency provisions) and 21 (prompt deviation reporting) with "malfunction".

- The title for Condition 6 was changed from “Emission Standards for Asbestos” to “Emission Controls for Asbestos” and in the text the phrase “emission standards for asbestos” was changed to “asbestos control”.
- General Condition No. 21 (prompt deviation reporting) was revised to include the definition of prompt in 40 CFR Part 71.
- Replaced the phrase “enhanced monitoring” with “compliance assurance monitoring” in General Condition No. 22.d.
- General Condition 29 was revised by reformatting and adding the provisions in Reg 7, Section III.C as paragraph e.

#### Appendices

- As discussed previously, the diesel fire pump was removed from the insignificant activity list in Appendix A and is included in Section II of the permit.
- Appendix B and C were replaced with revised Appendices.
- Changed the mailing address for EPA in Appendix D. Removed the Acid Rain addresses in Appendix D, since annual certification is no longer required and submittal of quarterly reports/certifications is done electronically.

**Blue Spruce Generating Center - HAP Emissions**  
Based on California Air Toxic Emission Factors

Pollutant	CAS No.	Emission Factors <sup>1</sup>		Emissions from <b>BOTH</b> Turbines <sup>2</sup>				Total (tons/yr)
		Natural Gas (lb/mmSCF)	Fuel Oil (lb/mgal)	Natural Gas (lbs/yr)	Fuel Oil (lbs/yr)	Natural Gas (tons/yr)	Fuel Oil (tons/yr)	
1,3 - Butadiene	106-99-0	1.270E-04		0.71		3.537E-04		3.537E-04
Acetaldehyde	75-07-0	1.370E-01		763.09		3.815E-01		3.815E-01
Acrolein	107-02-8	1.890E-02		105.27		5.264E-02		5.264E-02
Arsenic			2.020E-04		1.71		8.561E-04	8.561E-04
Benzene	71-43-2	9.090E-02	1.130E-02	506.31	95.78	2.532E-01	4.789E-02	3.010E-01
Beryllium	7440-41-7		5.430E-05		0.46		2.301E-04	2.301E-04
Cadmium	7440-43-9		3.250E-04		2.75		1.377E-03	1.377E-03
Chromium	18540-29-9		4.240E-04		3.59		1.797E-03	1.797E-03
Ethyl Benzene	100-41-4	1.790E-02		99.70		4.985E-02		4.985E-02
Formaldehyde	50-00-0	9.170E-01	7.050E-02	5,107.69	597.56	2.554E+00	2.988E-01	2.853E+00
Hexane	110-54-3	2.590E-01		1,442.63		7.213E-01		7.213E-01
Lead	7439-92-1		6.080E-04		5.15		2.577E-03	2.577E-03
Manganese	7439-96-5		1.030E-02		87.30		4.365E-02	4.365E-02
Mercury	7439-20-3		2.710E-06		0.02		1.148E-05	1.148E-05
Naphthalene	91-20-3	1.660E-03	1.080E-02	9.25	91.54	4.623E-03	4.577E-02	5.039E-02
Nickel	7440-02-0		4.880E-02		413.63		2.068E-01	2.068E-01
Propylene Oxide	75-56-9	4.780E-02		266.25		1.331E-01		1.331E-01
Selenium	7782-49-2		8.390E-06		0.07		3.556E-05	3.556E-05
Toluene	108-88-3	7.100E-02		395.47		1.977E-01		1.977E-01
Xylene	1330-20-7	2.610E-02		145.38		7.269E-02		7.269E-02

<sup>1</sup>Emission factors are from the California Air Toxics Emission Factors (CATEF) Database

**Total**

5.07E+00

<sup>2</sup>Emissions are based on the above emission factors and permitted fuel consumption limits